

Claims

1. A method of manufacturing a structure having interchangeable component parts comprising the steps of:

providing a precise numerically controlled assembly and machining tool;

providing a plurality of frame components;

fixture locating all of the frame components on the assembly and machining tool;

providing a plurality of detail parts;

fixture locating all of the detail parts on the assembly and machining tool;

operably associating at least one detail template with the assembly and machining tool; and

simultaneously machining the frame components and the detail parts with the detail template, so as to produce detail parts that are interchangeable from one structure to another.

2. The method according to claim 1, wherein the step of fixture locating all of the frame components on the assembly and machining tool is achieved by pre-drilling at least two locator holes in the frame component that are aligned with corresponding locator holes in the assembly and machining tool.

3. The method according to claim 1, wherein the step of fixture locating all of the detail parts on the assembly and machining tool comprises the steps of:

drilling at least two coordinating holes in the frame component;

pre-drilling at least two coordinating holes in the detail part that are aligned with the coordinating holes in the frame component; and

attaching the detail part to the frame component at the coordinating holes.

4. The method according to claim 1, further comprising the steps of:

pre-drilling small pilot holes in the detail parts; and

drilling attachment holes through the pilot holes after the detail parts have been fixture located on the frame components.

5. The method according to claim 1, further comprising the steps of:
providing undersized holes in the frame components;
positioning adjacent detail templates over the frame components;
providing attachment holes in the templates, the attachment holes being
5 larger than the undersized holes;
fitting the frame components and the detail parts together with undersized
pins that pass through the attachment holes and the undersized holes;
adjusting the fit of the detail templates by moving one detail template relative
to another detail template, the movement being restricted by the undersized pins;
10 removing the undersized pins;
drilling through the attachment holes and the undersized holes with a drill bit
having the same diameter as the attachment holes, so as to bore out the undersized
holes;
replacing the detail templates with the detail parts; and
15 fastening the detail parts to the frame components.
6. The method according to claim 1, wherein the detail parts are interchangeable
panels that form the exterior skin of an aircraft.
- 20 7. The method according to claim 1, wherein the detail parts are replaceable
panels that form the exterior skin of an aircraft.
8. The method according to claim 1, wherein the detail parts are hinged panels
that form the exterior skin of an aircraft.
- 25 9. The method according to claim 1, wherein the detail parts are fixed panels
that form the exterior skin of an aircraft.